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10/561,519

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Tetsuji Hirano

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466 7590 09/26/2008

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EXAMINER

GODENSCHWAGER, PETER F

ART UNIT

PAPER NUMBER

1796

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---|--------------------------------------|--|
| Office Action Summary | Application No. 10/561,519 | Applicant(s) HIRANO ET AL. | |
| | Examiner PETER F. GODENSCHWAGER | Art Unit 1796 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1-11 and 13-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1796

DETAILED ACTION

Applicant's reply filed June 26, 2008 has been fully considered. Claims 1-3 and 14 are amended, claim 12 is canceled, and claims 1-11 and 13-25 are pending.

Priority

Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on July 11, 2003. It is noted, however, that applicant has not filed a certified copy of the 2003-195428 or 2003-195429 applications as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-6, 9-11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Warren (US Pat. No. 3,356,645).

Regarding Claims 1, 2, 6, and 13: Warren teaches a salt of an imidazole (a mixture of a base (imidazole) and an acid) (2:36-58) such as 2-ethyl-4-methylimidazole (an imidazole where R¹ and R³ are different) and further that mixtures of imidazoles are used (giving two basic components in the mixture). The Office recognizes that all of the claimed physical properties are not positively taught by the reference, namely that the composition is ion/proton conductive. However, the reference teaches all of the claimed ingredients of the composition. Therefore, the

Art Unit: 1796

claimed physical properties would inherently be achieved by the composition as claimed and disclosed. If it is the applicant's position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties with only the claimed ingredients.

Regarding Claim 4: Warren further teaches that the imidazole and acid is mixed in a 1:1 ratio (3:25-27).

Regarding Claim 5: Warren further teaches that the imidazole salts are usually liquids or very low melting solids (2:29-32). The Office recognizes that all of the claimed physical properties are not positively taught by the reference, namely the melting point of the composition. However, the reference teaches all of the claimed ingredients of the composition. Therefore, the claimed physical properties would inherently be achieved by the composition as claimed and disclosed. If it is the applicant's position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties with only the claimed ingredients.

Regarding Claims 9-11: Warren further teaches acids that are structurally free of fluorine such as the inorganic acid phosphoric acid.

Claims 14, 15, 17-19, 21, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Warren (US Pat. No. 3,356,645).

Art Unit: 1796

Regarding Claims 14, 15, 17-19 and 21: Warren teaches a salt of an imidazole (a mixture of a base (imidazole) and an acid) (2:36-58). Warren teaches that the imidazoles is substituted at the 2, 4 or 5 position (giving imidazoles where R^1 , R^2 , or R^3 of instant claim 1 is a hydrocarbon group or hydrogen) (3:1-3). Warren further teaches the imidazole is 2-ethyl-4-methylimidazole (where R^1 is methyl, R^2 is ethyl, and R^3 is hydrogen) (3:1-3). Warren further teaches that the imidazole salts are usually liquids or very low melting solids (2:29-32). The Office recognizes that all of the claimed physical properties are not positively taught by the reference, namely that the composition is ion/proton conductive and has a melting point 120 °C or lower and a glass transition temperature of 25 °C or lower. However, the reference teaches all of the claimed ingredients of the composition. Therefore, the claimed physical properties would inherently be achieved by the composition as claimed and disclosed. If it is the applicant's position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties with only the claimed ingredients.

Regarding Claims 22 and 23: Warren further teaches acids that are structurally free of fluorine such as the inorganic acid phosphoric acid.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5, 7-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kreuer et al. (US Pat. No. 6,264,857).

Regarding Claims 1 and 13: Kreuer et al. teaches a mixture of a base (amphoteric material) such as a substituted imidazole with an acid (abstract, 3:58-4:20). Kreuer et al. further teaches that the imidazole may be substituted by hydrogen or a hydrocarbyl group such as methyl, ethyl, phenyl, butyl, or t-butyl (4:1-20). Kreuer et al. further teaches that the compositions are proton conductors (ion conductive) (1:5-10).

Kreuer et al. does not teach that a second base component is required for the composition. However, Kreuer et al. teaches that a solvent such as dimethylformamide or water (both compounds that will act as bases) may be added to the composition (4:30-35). At the time of the invention, a person of ordinary skill in the art would have found it obvious to add a solvent such as dimethylformamide or water to the composition, and would have been motivated to do so to disperse the amphoteric material if required for a coating articles (4:38-42).

Art Unit: 1796

Regarding Claims 2 and 7: While Kreuer et al. does not teach a specific embodiment where the 4 (R^1) position is substituted by a methyl group (where R^1 and R^3 are different), Kreuer et al. teaches that the imidazole may be substituted by methyl at any position on the ring (4:1-20). At the time of the invention, a person of ordinary skill in the art would have found it obvious to use an imidazole substituted by a methyl at the 4 position and would have been motivated to so because one would have a reasonable expectation of success as Kreuer et al. suggests that such compounds are suitable for use as amphoteric materials in a proton conductor (3:58-4:20).

Regarding Claim 3 and 5: Kreuer et al. does not teach a specific melting point of the composition. However, the reference renders obvious all of the claimed ingredients of the composition. Therefore, the claimed physical properties would implicitly be achieved by the composition as claimed and disclosed. If it is the applicant's position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties with only the claimed ingredients.

Regarding Claim 8: While Kreuer et al. does not teach a specific embodiment where the 2 position is substituted by an ethyl group, Kreuer et al. teaches that the imidazole may be substituted by an ethyl at any position on the ring (4:1-20). At the time of the invention, a person of ordinary skill in the art would have found it obvious to use an imidazole substituted by an ethyl at the 2 position and would have been motivated to so because one would have a reasonable expectation of success as Kreuer et al. suggests that such compounds are suitable for use as amphoteric materials in a proton conductor (3:58-4:20).

Art Unit: 1796

Regarding Claim 9: Kreuer et al. further teaches that the acid component comprises acids such as p-toluenesulfonic acid and methylsulfonic acid (acids structurally free from a fluorine atom) (2:53-67).

Regarding Claims 10 and 11: Kreuer et al. further teaches that the acid component comprises an inorganic acid such as phosphoric acid or sulphuric acid (3:1-2).

Claims 14-20 and 22-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Kreuer et al. (US Pat. No. 6,264,857).

Regarding Claims 14-16, 20, and 25: Kreuer et al. teaches a mixture of a base (amphoteric material) such as a substituted imidazole with an acid (abstract, 3:58-4:20). Kreuer et al. further teaches that the imidazole may be substituted by hydrogen or a hydrocarbyl group such as methyl, ethyl, phenyl, butyl, or t-butyl (4:1-20). Kreuer et al. further teaches that the compositions are proton conductors (ion conductive) (1:5-10).

While Kreuer et al. does not teach a specific embodiment where the 4 (R^1) position is substituted by a methyl group (where R^1 and R^3 are different), Kreuer et al. teaches that the imidazole may be substituted by methyl at any position on the ring (4:1-20). At the time of the invention, a person of ordinary skill in the art would have found it obvious to use an imidazole substituted by a methyl at the 4 position and would have been motivated to so because one would have a reasonable expectation of success as Kreuer et al. suggests that such compounds are suitable for use as amphoteric materials in a proton conductor (3:58-4:20).

Kreuer et al. does not teach a specific melting point of the composition. However, the reference renders obvious all of the claimed ingredients of the composition. Therefore, the

Art Unit: 1796

claimed physical properties would implicitly be achieved by the composition as claimed and disclosed. If it is the applicant's position that this would not be the case: (1) evidence would need to be presented to support applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties with only the claimed ingredients.

Regarding Claims 17 and 18: Kreuer et al. does not specifically teach an embodiment where R^2 (2 position) is a hydrocarbon group such as ethyl. However, Kreuer et al. further teaches that the imidazole may be substituted by hydrogen or a hydrocarbyl group such as ethyl at any position on the ring (4:1-20). At the time of the invention, a person of ordinary skill in the art would have found it obvious to use an imidazole substituted by an ethyl group at the 2 position and would have been motivated to so because one would have a reasonable expectation of success as Kreuer et al. suggests that such compounds are suitable for use as amphoteric materials in a proton conductor (3:58-4:20).

Regarding Claim 19: While Kreuer et al. does not teach a specific embodiment where the 5 (R^3) position is substituted by a hydrogen, Kreuer et al. teaches that the imidazole may be substituted by hydrogen at any position on the ring (4:1-20). At the time of the invention, a person of ordinary skill in the art would have found it obvious to use an imidazole substituted by a hydrogen at the 5 (R^3) position and would have been motivated to so because one would have a reasonable expectation of success as Kreuer et al. suggests that such compounds are suitable for use as amphoteric materials in a proton conductor (3:58-4:20).

Art Unit: 1796

Regarding Claim 22: Kreuer et al. further teaches that the acid component comprises acids such as p-toluenesulfonic acid and methanesulfonic acid (acids structurally free from a fluorine atom) (2:53-67).

Regarding Claims 23 and 24: Kreuer et al. further teaches that the acid component comprises an inorganic acid such as sulfuric acid (3:1-2).

Response to Arguments

Applicant's arguments, see reply, filed June 26, 2008 with respect to the rejection(s) of claim(s) 1, 2, 7-16, 19, 20, and 22-25 under 35 U.S.C. 102(b) as being anticipated by Kreuer et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kreuer et al. under 35 U.S.C. 103(a).

Applicant's arguments filed June 26, 2008 with regards to the rejections over Warren have been fully considered but they are not persuasive.

Applicant argues that Warren does not teach that the composition is ion conductive or have a specific melting point and glass transition temperature. However, as set forth in the rejection above, as Warren teaches all of the ingredients of the claimed composition, the composition as claimed and disclosed would inherently have the property of being ion conductive and have the claimed melting point and glass transition temperature. Applicant argues that Warren does not recognize the advantage of the composition having two base or two acid components. However, as Warren teaches that the imidazole (base) component comprises mixtures of imidazoles, the teaching of Warren anticipates the claimed composition.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PETER F. GODENSCHWAGER whose telephone number is (571)270-3302. The examiner can normally be reached on Monday-Friday 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo, Ph.D./
Supervisory Patent Examiner, Art Unit 1796
24-Sep-08

/P. F. G./
Examiner, Art Unit 1796
September 17, 2008

Application/Control Number: 10/561,519

Page 11

Art Unit: 1796